



FOR ACOUSTIC COUPLERS

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# Computer Weekly

Thursday, July 22, 1982

## Ops fare badly in technical pay stakes

by

Andrew Thomas

UK computer operators are among the worst-paid workers in the technical sector, according to a survey published last week. Only laboratory assistants, who typically receive £4,238, get less than operators, whose average income stands at £4,800.

Throughout the UK 373 firms were polled, returning details on 16,250 different job categories. Despite being awarded pay increases of 11.6%, compared with the national average of 9.5%, operators still fare the worst in the pay stakes.

Programmers can now expect a salary of about £6,750, having had rises equating with the national average, and DP managers are paid a median salary of just under £12,000.

DP workers in the Grampian area are paid consistently more than those working in any other region. Operators can expect £5,796, programmers £8,540, and DP managers £14,600.

The worst-paying area for operators is Yorkshire, where the average pay packet holds just £3,822. Programmers in Manchester only manage £5,500, and the

poorest DP managers live in the Nottingham/Derby area, where they earn only £3,585.

Salaries also vary significantly between different types of industry. Operators and programmers working in the chemical industry are the best-paid, while a DP manager can expect the best remuneration package from the finance sector.

Electrical engineering firms pay their operators the lowest wages, programmers are worst-off in publishing, and the poorest paying industry for DP managers is mechanical engineering.

Data preparation supervisors get an average salary of £5,585, and their operators £4,152. Both job categories attract the highest rates of pay in London, with £6,508 and £5,437 respectively.

Lowest salaries are again to be found in one region, Hampshire and Dorset, where the rates are £4,840 and £3,585.

Median Analysis of Salaries and Wages, Summer 1982, Reward Regional Survey, 1 Mill Street, Stone, Staffs ST15 8AA, £15.

UK data processing salaries in the year ended spring 1982.

## Lamsac sets up ethics watchdog

by

Kevin Cahill

THE UK's main local government computer organisation has set up a watchdog to report on ethics and security in the handling of computer records by the social services.

The Ethics and Security subcommittee set up by Lamsac (Local Authorities Management Services Computer Committee) is to report next year on the problems that the UK's town halls will face under the proposed legislation on data privacy. The group will be chaired by Professor Phyllida Parslow of Bristol University. And according to Richard Ling-

ham, Director of Social Services for Cornwall and one of those responsible for setting up the subcommittee, the existing code of practice and government proposals must be looked at to make sure that the privacy of social security clients is maintained.

"There are three categories of client in the social services system, those who come for advice, those who come for help, and those who are placed under the statutory care of the social services."

Lingham said that the information held on each client, particularly in computer systems, had to be considered from an ethical point of view in relation to those who could share or have access to that information.

But he added that the "ethics element" of the committee's brief would be both the most prob-

lematic and the most important.

Ethics covers the way in which information held by the social services was coded and handled.

The committee would be relatively straightforward and would principally concern the implementation and control of the proposed code of practice.

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# Auditors 'watchdogs for privacy' - NCC

by Andrew Thomas  
COMPANY auditors could be the public watchdog for privacy, as well as for financial malpractice.

That is the proposal of the National Computing Centre and major accounting firm Deloitte, Haskins & Sells, based on their pilot study made in the North-west of England.

They propose that external auditors check that computer systems meet legislative requirements, in a report submitted to the Home Office.

Half of the £70,000 needed to carry out the investigation came from the Department of Industry, and the remainder from the coffers of the NCC. Auditors from Deloitte, Haskins & Sells carried out the investigations on organisations

such as the Trustee Savings Bank, Royal Life Insurance, United Biscuits and the City of Liverpool Corporation.

According to Ian Douglas, a senior consultant at the NCC who worked on the project, the privacy shortcomings discovered were of a minor nature.

"The sort of thing we found was much as we expected," said Douglas. "There were no major breaches. The main shortcomings lay in areas such as waste disposal and in the fact that not many companies validate personal data, such as dates of birth, in the same manner as financial information."

The auditors used standard techniques, and checked areas such as access control to computer and terminal rooms. "We also ran

Deloitte's Auditape package against personal files looking for odd data - the sort of thing you didn't expect to be there," said Douglas.

The audit team comprised four people, two with extensive audit experience, and two with a computing background.

The report claims that external auditors, provided they have adequate computer experience, are well qualified to carry out privacy audits. The NCC expects that some form of independent check will be seen as desirable even if the Home Office does not make such checks mandatory.

"The project showed that the costs of such an inspection was relatively small," said NCC director David Fairbairn.

## Printers presented to secondary schools

by Andrew Thomas  
SCHOOLS in Leeds have been given free printers, a chance meeting at a Rotary Club dinner.

David Noble, computer manager at cash-and-carry firm Makro's Leeds store, had 20 Hewlett-Packard 2762A printers each worth £5,000 when new, standing idle due to a hardware upgrade.

And, in conversation with the chairman of one of the local schools' parent-teacher associations, discovered a worthwhile means of disposing of them.

Every secondary school in Leeds has a Research Machine 380Z, provided by the local education authority and government funds, but they have to buy the peripherals themselves. As a result, not every school had printing facilities and were unable to make full use of the machines.

"The obvious thing was to give the printers to them," said Noble, "so we installed one on a trial basis."

No major problems were encountered, and Makro presented all 20 printers to Leeds education department, three or four going to each school. And it looks as if other schools in the area will be receiving free hardware soon.

## MP attacks technology venture cash

### From front page

which means that it has stopped doing any business and that there are no plans to re-foro the company, leaving users of some 100 Altergo products out on a limb. Altergo bad already withdrawn Isaac's licence for the Shadow 11 teleprocessing monitor and Quota II software in September 1981, but it was unable to terminate licences for Shadow customers using CPG and the GUTS time sharing system until June this year.

A company called Altergo Inc was set up last year by Altergo to support the 200 users of Shadow 11 and Quota II, but there has been some confusion over the remaining 100 customers during the handover from Britton-Lee.

According to Elizabeth Skerrett-Smith, marketing manager for Altergo Software, the company is suing Britton-Lee for hundreds of thousands of dollars. "The monies that should have been paid in royalties since the takeover."

Allen describes the system as "very user-friendly and simple:

## 'Anything you want' out of Aids database

by Nicholas Enticknap

THERE are now so many sources of government financial assistance that it is easy to miss out through sheer ignorance. And even if you do know about a scheme, the details are constantly changing.

To help those whose job it is to know about such things, a unit at Strathclyde University has built a shortlist of suitable ones. There are filters for location, industry, purpose of aid (such as to buy equipment, or to help the disabled), nature of incentive (grant, loan, or tax concession) and administrative department.

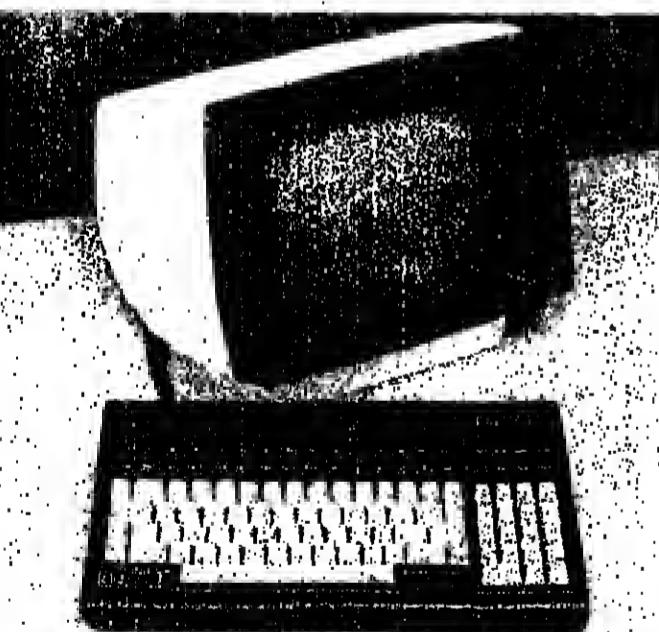
When a short list has been obtained, the user can browse through the list, and obtain details of any time restriction on the scheme; the address to apply to, and so on.

Allen says he has been having discussions with three potential large-scale users of the system - a government department, a bank and a regional authority. The system will not be marketed, but Allen would be happy to talk to anyone who feels they can make use of it.

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FAIRBAIRN . . . "Inspection costs relatively small".

## SALES BRIEF

### Leasco wins police contract

LEASCO Software has won a £500,000 contract from Cumbria Police to supply a resource management and message switching system similar to the one it supplied to West Midlands Police. Leasco was picked from a shortlist of six companies.

The system, which is due to be implemented late next year, will be based on two Ferranti Argus 700GL minis operating in hot standby mode and it will allow the county's seven control centres to pool all their information. It will also be linked to the Police National Computer.

The system will prove to be standard, so we can buy them from other sources. There is unlikely to be any problem with the software as it has been installed for a considerable time.

Support for these machines comes directly from the manufacturer, but the Hartley computer was manufactured in Australia.

The user group as yet has no definite information on the possible Star Group takeover bid, although the receiver has promised that they will be in on the final

# Australian firm's UK users find lucky Star

using a grant from the Australian government.

"In the past the Hartley mini has been a piece of fairly trouble-free equipment, but there could be problems with the spares being produced in Australia", said David Woods, secretary of the Hartley Users' Association.

The London company is set to buy Hartley's UK operation, which is still trading under the control of the receiver.

Hartley specialised in systems for accountancy practices and about 10% of its UK users have the Australian company's own 3900 computer. The remainder use DEC, Wang or Data General machines.

Star Group's Auditor range of minicomputer systems is roughly comparable to the Hartley HAPAS accountancy system, so it would be a logical move for Star to adopt the Hartley users.

Star managing director David Blechner refused to confirm or deny the takeover.

"We are talking to Hartley about acquiring them," he said.



BLECHNER . . . "Talking to Hartley about acquiring them".

## HP minis run into radio interference

by Howard Karten and Nicholas Enticknap

SEVERAL users of Hewlett-Packard HP-3000 minicomputers in Manhattan have reported an unusual problem: radio frequency interference has affected the data stored on their disc drives. The problem can be localised to the extent that with two systems in the same computer room, only one might be affected. Once it occurs, however, it is persistent.

There seems no reason why the problem should be restricted to Hewlett-Packard systems: other users may be suffering the same problem but be unaware of what is causing the trouble.

A Hewlett-Packard spokesman in New Jersey said that the specification for the electromagnetic interface for disc drives defined a maximum tolerance level, and if this was exceeded, problems could arise. In the short term the solution to the interference was simply to switch the drive off and on again.

In the longer term the cure was to correct the environment.

There are ways of shielding the room so as to prevent the interference from affecting the drives. The spokesman pointed out that Hewlett-Packard itself had offices within the affected area, and the computer system there had never suffered any trouble.

That Manhattan should be so badly affected was not surprising, he added: it is a media centre and has many sites with high levels of radio emission.

The spokesman added that the problem had been encountered in other areas, particularly in sites located close to airports. Hewlett-Packard in the UK, however, said that they had no knowledge of similar problems here.

## Consultancy ex-employees set up new company with £500,000 orders

by Maggie McLening

A BREAKAWAY group of ex-employees has launched a new company with over £500,000 worth of orders.

Effectively the entire business

systems division of the D'Morais group has formed Advanced Business Technology, leaving the specialist areas of education, time sharing and consulting with the original company.

There was a lot of interest, but our group of staff managed to raise substantially more than expected, and the Midland Bank offered to match us under their Venture Capital Scheme, so we were able to put the highest outside bid. All the software and stock has come from the original business division, so we are effectively the same company as before, but with more freedom", said Andrews.

"It was really a question of putting your money where your mouth is. The funding required for quantum selling in the business

coincide with the company launch, ABT has announced an

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D-4006 Erkrath 2  
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Telex 8 581 180

Handling tips



# IBM's golden clouds still have black linings

WALL STREET, ever loyal to IBM, waxed quietly euphoric at the latest results from Mr Blue, despite some clouds on its horizon.

In an announcement which opened the half-yearly reporting season for American corporations, IBM led the way with figures that appeared to put it back on a growth path – something which has largely escaped the corporation for the last three years.

Profits for the first six months were 15% up at \$2.77 billion on the same period last year, and sales rose behind the profits by 13% to £15.12 billion. The half-year figures were even more spectacular, with profits up 24% at £1 billion, and sales 17% ahead at \$8.05 billion.

The quarterly profit of \$1 billion was the first produced by the cor-

poration not for a traditionally buoyant first quarter. The Wall Street stockbrokers showed their joy by pushing up the share price and Wall Street.

Not that the money would do any harm to IBM or its debts of \$3 to \$5 billion, to which the company is adding a further \$500 million of 25-year long-term stock this week.

Additionally, there is the unresolved dispute with the BBC Commission over allegations of abuse by IBM of its dominant position in the European computer marketplace.

But there are two or three black linings to the sudden golden clouds on IBM's horizon. Earlier this year, IBM authorised the creation, though not the sale of 100 million new shares.

Whatever IBM's actual position, the growing European anger over the US trade war with the Eastern bloc (and with everyone else) may influence the BBC's attitude to IBM.

This will certainly be the case, if

as one canny observer in California remarked, "The Japanese scandal does for IBM what Chile did for ITT." What he means is that if the Japanese situation proves (not necessarily legally) to have been a

case of maliciously motivated entrapment, then IBM will emerge as the black sheep, putting its growing Japanese connections with Matsushita and the NTT in Japan in jeopardy.

In the wake of what may prove to be an ill-judged involvement in the FBI attack on the Japanese, the dislike may turn to government hostility worldwide and increased customer resistance.



Will the FBI connection cost IBM dear?

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## IBM-Matsushita micros project looks set to go ahead despite rift

DESPITE the rift between the Americans and the Japanese following the industrial espionage case in California, new links between Japanese and US computer companies continue to flourish.

One of the major new connections is the joint venture project between IBM and Matsushita to manufacture a range of small micro and business machines in Japan for the American giant. It is rumoured that the deal is about to be made formal.

According to Japanese sources, IBM approached Matsushita, one of Japan's biggest and most efficient electronics companies, about a year ago.

IBM, anxious to concentrate on its large machine business, but in-

terested in extending its product range into the personal micros for telecommunications networks, Burroughs is also thought to be interested in a worldwide marketing deal for Hitachi's small scale computer systems.

The IJL also quoted the Japanese Ministry of International Trade and Industry as welcoming the collaboration between the two companies and seeing it as a move to lessen the growing tension in high technology trade between Japan and the US.

Another link-up announced in Japan and also affecting one of the parties to the IBM secrets case, is that between Hitachi and Burroughs. According to the Japan Economic Journal, Burroughs is negotiating to introduce Hitachi's

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## Services slimmer after slump

by Boris Sedeeva

THE UK computer services industry has taken off again – but is doing it with fewer people.

Latest government statistics show that the industry has recovered from its slump in early 1981 and that billings for the end of the year had gone up by 5% to £158 million and were 1.1% higher than at the end of 1980.

But the increase is not uniform and a close look at the figures shows that some traditional areas of revenue, such as data preparation, are shrinking.

"Employment in services companies is plateauing at the moment," said Doug Eleyons, director-general of the Computing Services Association.

The company, which markets Texas Instruments and Oryx equipment, came to the Stock Exchange Unlisted Securities Market on the day the market opened last year, and was also the first computer company to use the new facility.

However Scan chairman Martin Baldwin remained confident in the face of City uncertainty and his patience appears to have paid off. Turnover for the first half of 1982 rose to £1.94 million compared with £1.53 million for the same period last year.

Profits of £78,000 were declared for the half-year compared with losses of £140,650 for the same period last year.

## CW SHARES TABLE

Fence	London Stock Exchange		Pence	Index 109.85	Change +1.7
	Stocks	Price			
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by Philip Hunter

# The man who plans to do away with programming

ARNOLD ARNOLD is not an ordinary name. Neither is the man.

Known just as Arnold to his friends, he has set out with the aim of demolishing the computer industry as we know it and rebuilding it on what he believes is firmer bedrock.

He has announced the discovery of what he calls the general systems computer program generator. This, he claims, will eliminate the need for any software programming, although it will not dispense with human value judgments.

Arnold makes the further extraordinary assertion that his generator is a perfect model of the mechanical aspects of the central nervous system.

Just for good measure, he also claims that the algorithms and expressions embodied in his systems generator define the Unified Field Theorem — the relationship between universal processes such as gravity, electromagnetism, nuclear interaction and time.

Einstein identified this theorem, but was unable to establish it.

Such astonishing assertions clearly need looking into, so I went



ARNOLD... "What is evidently being sought avidly by governments, academics and industry is already available for £15 or so any day or night in Soho."

along to speak to the man whom some regard as a great genius, others as a crank. I was confronted with a powerful personality who expresses views lucidly and eloquently about sex, God, politics, and in particular his general systems algorithm.

The discussion was fascinating

— and I certainly did not strike me as a crank.

But Arnold still has a lot to prove, for he did not show me the mathematics behind his system.

Hardly surprising if his claims are genuine — it would be a plagiarist's paradise.

All I can say is that he has a

caucus of close confidants who are

familiar with his mathematics and

believe it to be correct.

The rest of us will have to be patient.

Arnold explains that his system begins with a defined universe within which the application will operate. It then generates series of numbers and sums that include the possible operations and relationships for systems of given size within that universe. These sums are, of course, finite, but are supposed to represent closely the infinite series that would exactly

model the system.

The big difference between his system, and conventional ones, he emphasises, is that it offers not one answer but two — a subjective one and an objective one. "It shows how the human nervous system and brain, or a computer, can reduce the sum of all possibilities within any defined environment to two options, or option groups," he says.

It is then up to the human recipient of the computer's wisdom to determine which of the two options is correct in the instance in question.

The system reduces all these possibilities, eliminating redundancies to just a few key games characteristic of noughts and crosses.

Arnold gives as a simple example of his system algorithm in action the game of noughts and crosses.

The perfect game is, of course, a draw. Arnold makes an interesting observation on this, pointing out that there are altogether 45 possibilities exercised by both players in a noughts and crosses game played to the last move. There are nine choices for the first move, eight for the second and so on (1 + 2 + ... + 9 = 45).

The first player enjoys 25 of these choices (every alternate number starting with nine), the second 20. "The first player therefore has five more opportunities to make a mistake than the second," he says, given that the draw is the perfect outcome.

For Arnold, the computer will never be any more than machine

crosses played on a two-dimensional three by three board — nine squares altogether.

Arnold's system algorithm generates the sum of all possibilities both rational and irrational, which he says includes the intentions of the players. The sum includes all perfect and wrong moves and their redundancies within the finite series that characterises the game, including cheating. The total number of possibilities then comes to 618 billion, just for noughts and crosses.

The first player enjoys 25 of these choices (every alternate number starting with nine), the second 20. "The first player therefore has five more opportunities to make a mistake than the second," he says, given that the draw is the perfect outcome.

So there we have Arnold — crank or genius, possibly both. Nevertheless a provocative man who will stimulate a great deal of debate.

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## It's a long and steep road to computer wisdom — especially if you're blind

COMPUTER programming has less barbed wire fences around it than most professions for blind people, but there are still problems. For although there are now many Braille terminals around, they are still limited in scope, and many are not all that reliable. It is particularly disconcerting for blind people when they encounter unexpected misprints and page throws.

Terminal rooms may be less hazardous places of work than many for blind people, but there is still the problem of getting there, and then avoiding briefcases, chairs and sandwich boxes left inconsiderately in the middle of the office floor. Surprising how easy it is to lose confidence when you keep tripping up on things.

This work will involve reading electro-cardiograms, which will highlight another problem facing blind computer users, the lack of good graphics output.

Stockman explains that he is hoping to liaise with Bradford University on a project to produce hard copy graphs in Braille for blind users. "This may be specific to my work, but hopefully something generalised," he says.

Could this be yet another example of a marketable product emerging from specific university research?

Stockman suffered problems with the Braille terminal used for his degree course. This was a Sagem terminal, which produces hard copy Braille output. "It wouldn't line feed and kept inserting odd paper throws," he says.

As a result, Bradford is looking at other Braille terminals, including Versabraille, which produces soft copy Braille displayed on a screen. It is the equivalent of a VDU, and particularly useful for editing text or stored programs.

Such everyday nightmares as taking exams need special arrangements for blind people. For Stockman, the text of the exam papers was fed into the computer and then dumped in Braille.



STOCKMAN... "Liaising with Bradford University to produce Braille graphics output."

He took the exam in a room of his own, using a portable Perkins Braille typewriter, then read his answers from the Braille copy he had made out to cassette. "I was allowed an hour extra plus reading time," he explains.

The filling of Stockman's four-year sandwich course was a year working for Rolls Royce in Bristol. Here he gained experience of a

wide range of hardware, including Digital Equipment, IBM and Control Data. "This was the main contributory factor to my first class degree," he says. "I was a good average for my first two years, but much better when I came back for the final year."

"Tragically, at least on paper, the sandwich course has now been scrapped."

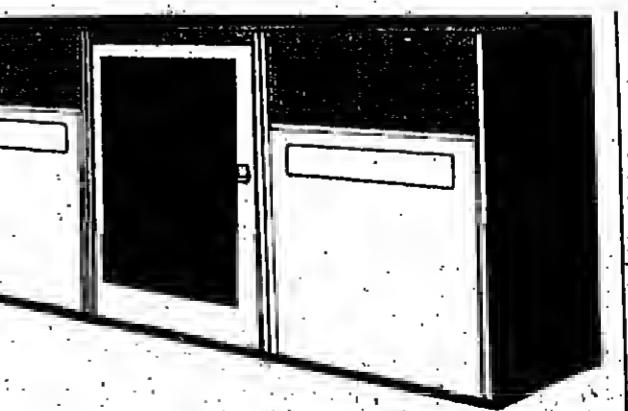
### PUZZLER

61 52 63 94 46 18

GIVEN the fact that the five "intervals" (between each pair of adjacent numbers) are not relevant to the problem, on what logical basis has the sequence been assembled? See page 59 for solution.

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Principles of Infotecture—8

# Technoscopes vital in system design

THE Eighth Principle of Infotecture states: "The art of system architecture is so complicated that we must be able to analyse the design status, relative to our design goals, from many levels, from many conceptual points of view, and at many points in time during development."

I like to call the tools used for such design analysis "technoscopes".

Technoscopes are conceptual tools for helping us to understand many-aspect situations. A well-known analogy to the Technoscope is the chessboard. Imagine playing successful chess with only the list of moves to guide you, while your opponent had a chessboard to evaluate the position.

Another well-known Technoscope is the decision table. Percharts and even "n-squared charting" developed by Lano (published in the North-Holland TRW series) are Technoscopes for analysing system design situations.

I would like to argue here that we need several more such Technoscopes if we are to play the game of system design successfully.

A dramatic illustration of the need for such Technoscopes is the

account by Barry Boehm of TRW Systems where he tells a detective tale of trying to find the reason for an apparent lack of programmer productivity.

Analysis of lines of code produced, compared to lines of code delivered on their projects, yielded the startling fact that 180 lines were produced for every 100 actually delivered.

The cause was rewriting of the code to meet tough contract specifications for performance and other attributes.

But the code rewriting was not due to sloppy programming as you might expect. It was primarily due to faulty design specification, not at the lower levels of module and logic design, but at the higher levels of the system architecture specifications.

The basic cause was incorrect and particularly inadequate design technique specification. Maybe 30 design decisions had been made already, but another 20 or so were really needed to give the system the properties required by the contract.

The cause of the "bad design" was not bad designers — no more than it would be the fault of a chess team who lost if they were forced to play without chessboard visuali-

ation. The rewriting of code was largely dropped when the requirements-properties matrix analysis was taken into use. The people were the same, but they had a better



Tom Gilb is an independent consultant, lecturer and author on computing topics.

The cause seemed to be that when a few dozen high level decisions had been made for a project, nobody was really able to see the weak points in the design. There were too many techniques specified, and no systematic way of relating them to the contract requirements.

T R W developed a "Chessboard" (Boehm IFIP proceedings 1974 or Gilb: Software Metrics if you want to see his examples of it). They called it a "requirements/properties matrix". I have since modified the concept in minor ways and included it in my Design by Objectives toolkit (Function/attribute table). It is remarkably similar visually to a chessboard, but is simply a checklist of how the planned techniques of design impact the requirements. It leads to such a detailed and systematic analysis of the design that you are more likely to spot weaknesses in the design before you begin to code it or promise someone a delivery date.

That was the result at TRW.

The rewriting of code was largely dropped when the requirements-

properties matrix analysis was

taken into use. The people were

the same, but they had a better

## DOWNTIME

### Long distance problems of the lonely hearts

INHABITANTS of the Falkland Islands are turning to the important issues of life now that the squatting Argentinians have been evicted. One of these issues is sex.

Our Falklands man will, in common with others in remote parts, receive only half the service, to the by empathy. Therefore they get a list of partners, but do not go to the list of other members of DMT.

Dateline normally does two things for new members of its lonely club. First it performs a computer run to find a list of compatible members of the opposite sex. It sends this list to the new member, who can then go into action.

Second, Dateline adds new members to its database from which suitable partners for other new members are selected by the computer. Therefore a member has two ways of finding a date — he/she has a list of prospective

partners to approach, or he/she may get an offer that can't be refused from someone on whose list of partners he/she is.

A young Falklander has taken

desperate measures by sending his vital statistics to Dateline International, the London-based computer dating company.

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A young Falklander has taken



## Apple names MD for European operations

APPLE Computer has named Joseph O'Keeffe managing director of its manufacturing operations in Europe. He will be based in Ireland, where the company has two manufacturing facilities. The main one is in Cork, established two years ago to manufacture Apple II and Apple III microcomputers for the European market. The other plant, in Millstreet Town, makes

electronic keyboards and peripherals for micros.

O'Keeffe was previously general manager of AT&T's Irish subsidiary Electron. He has also held senior management positions with General Electric in the US and its subsidiary in Ireland Econo, and with Emerson Electric Company's Irish subsidiary, Ridge Tool Ireland.

■ Ian Durrell has been appointed to the new post of general manager of European operations for the software products group of Informatics General Corp. The European operations HQ will move from Geneva to London in six months time. Durrell joined the company in 1970 as a systems engineer.

■ Gordon Pease has joined Comptech as European manager, services and support. He was previously worldwide business manager with ICL.

■ Tudor Ellis has joined Time and People as bureau manager. He was previously manager of general services at Lowndes-Ajax Computer Services.



## Bringing it all back home...

10 Manchester, birthplace of computing in Britain. To Bell Vue from November 25th to 27th—the obvious place for the Northern Computer Fair.

Following the incredible success of our London show, the biggest ever personal computer exhibition where over 380,000 people visited us in 3 days, we're going to repeat the performance in Manchester.

What every our specialists live by business—personal computers; home computing; small business systems; associate software—this is the exhibition designed for you.

It's the ideal showcase for companies who need to demonstrate to a fast expanding and increasingly well informed audience all aspects of personal computing.

You cannot afford to ignore it.

For further details about exhibiting at the Northern Computer Fair, contact the Advertisement Manager, Practical Computing, Room 130, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS. Telephone: 01-661 3500 Ext 3021.

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*Practical Computing*

■ Neil Cockburn, managing director of BDP Computing Services, has accepted a partnership with parent company Building Design Partnership. He has been with the company since 1977, when he joined as computing manager.

■ Harpal Singh Gill has joined Stanton Automation to supervise the production engineering of the company's sequencing and automatic control systems. He studied at Bradford University for a PhD as a research assistant. Before this he read mechanical and production engineering at Brunel University.

■ Robin Farmer has joined Systems Production as commercial sales engineer. He was previously sales director with Protronics.

■ David Wase has been appointed financial controller for the Wrexham operation of Gould's electronic power conversion division. He was formerly with Racal-Dacca at Bridgnorth.

■ Edward Tobin has joined management consultancy Butler Cox and Partners as a principal consultant specialising in the management of information technology projects.

■ Alan Russell has joined Multicomputer as business manager. He joins from Mannesmann Tally, where he was marketing manager, computer peripherals. Before that he spent 14 years with Burroughs, leaving as product promotion and industry marketing manager.

■ Ruth Alexander-Morgan is launching a word processing service for software publisher Understanding Ltd. It is aimed at small businesses which would benefit from using a word processor, but cannot afford either the equipment or the staff. Details 01-450 1144.

■ Tom Leonard has been appointed development project director at Precision Software. He was previously an independent consultant. Nigel Lovett-Turner joins the company as finance director. He was formerly sales manager at Hamlet Computer Group. Colin Spencer, formerly with Leasco, has been named technical manager at Precision. Precision Software was formed recently by ex-Computerplan technical director John Tranmer, to provide software for the Unix market.

■ Anthony Colls has been appointed divisional manager TV Systems, at Chubb Alarms. He was previously in marketing with Siemens.

■ Kevin Graham has joined Btach as components specialist. He was previously a product manager with BA Electronics.

## UK boss for Nokia

NOKIA UK, subsidiary of Finland's largest industrial corporation Nokia Oy, has appointed Peter Cox as managing director.

He joins the company after 10 years with Philips, which he joined as a senior salesman, going on to become a sales manager and then regional manager. In 1979 he became sales support group manager. A year later, on the formation of Philips Business Systems, he became general manager for the Southern group, transferring to general manager of small business computers last year. By the time he joined Nokia, he had been promoted again to business development manager for the small business computer activities within the data processing division.

One of Cox's first announcements is the appointment of CEMA Business Services as the first Nokia terminal systems distributor in the North of England.

■ Commander Nevill Paster is to retire as managing director of Mastiff Security Systems in September, but will remain on the board. After retiring from the Royal Navy in 1962, he joined Balfour Automation and became a founder member of BA Space and Advanced Military Systems. He launched Mastiff in 1972.

■ Geoff Coates has been named franchise manager for Crelles Microsystems' newly-acquired Data General distributorship. He has been selling Crelles Microsystems products for the past three years and was previously the franchise manager for Zilog.

■ Helmut Fricke, formerly with Perkin Elmer, has joined Atlantic Computer Leasing's sales operations in Northern Germany. Bernd Krusemann, previously with Mavic Lease, is responsible for sales in the Benelux countries.

■ John Patterson, former national sales manager with Apple Computer, has been appointed UK sales manager and marketing manager for Epson UK, with responsibility for the forthcoming launch of the company's new microcomputer range.

■ Anthony Colls has been appointed divisional manager TV Systems, at Chubb Alarms. He was previously in marketing with Siemens.

■ Kevin Graham has joined Btach as components specialist. He was previously a product manager with BA Electronics.

## DIARY

### AUGUST 3

Date administration working party, BCS. Details David Stenton, 01-486 3947.

### SEPTEMBER 8

OTL Give Voice to Information Management. Meeting on OTL's Information Management Processor. Institute of Information Scientists WP and computer information systems special interest group. OTL, London. Tel Heleco Harris on: 01-229 5069.

### JANUARY 5-6

Viewdata Conference on the state of the art. Institute of Information Scientists WP and computer information systems special interest group. OTL, London. Tel Heleco Harris on: 01-229 5069.

### COURSES

■ A ONE-DAY course for amateur or professional technicians who are interested in making or modifying aids and equipment for disabled people is being held in Milton Keynes on September 25. The course is said to be the first of its kind in the UK and it aims to familiarise technicians with different types of disability. Disabled people will be present to give their views as consumers. Topics include adapting microcomputers. Venue is the Neath Hill Professional Workshop, Milton Keynes. Enquiries to Castle Priory College, Thames Street, Wallingford, Oxford OX10 0HE. Tel: (0491) 37351.

■ A PART-TIME version of the NCC Basic System Analysis course is being presented by the Polytechnic of Central London. It will start in October 11 and take place on Thursday afternoons and evenings for 30 weeks. It is intended for those who can't afford the full-time course. PCL has run a part-time course for nearly 10 years. Details from The Registry, School of Management Studies, Polytechnic of Central London, 33 Margaret Street, London NW1. Tel: 01-580 0111 ext 250.

■ ACCOUNTING Principles and Practice is a course designed to give accounting know-how to programmers and analysts. The workshop, organised by BIS Applied Systems, will be held on September 23-24 at the Park Court Hotel, London. It aims to show how accounts data is recorded and

processed and will examine costing and budgeting as well as the production of financial statements. The course gives a background for the survey and design of accounting based DP applications and aims to extend the business knowledge of the delegates. Fee is £265+VAT. Details from Soral Wall on 01-261 9237.

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## PRODUCTS



The Q850 from Quantec.

## MAI develops costing system for printers

A PRINTERS' costing and estimating system has been announced by MAI.

Called Prince, the system has full word processing capabilities, and runs on MAI's range of computers, including the company's recently announced S-10 microcomputer.

The system provides day-to-day information for production departments, including sales analysis of completed jobs, and is capable of full integration with all accounting ledgers, payroll and stock control and reporting recommendations laid down by the British Printing Industries Federation.

The package provides facilities for the costing of work in progress, detailed analysis of mark-up with profit percentage indicators, job labour input analysis over cost centre, listings of slow-moving jobs and a comparison between actual and budget hours for each cost centre.

The estimating function enables all details from an estimate to be automatically transferred, creating a new job once the estimate has been accepted. Another option allows for the automatic production of job-bag details.

The new system, Net/Alert, measures and analyses all transmissions throughout a network. It provides complete status and performance information concisely, alerts operators to problems such as line errors or slow response times and allows planners to pinpoint traffic trends for future network extensions or reconfiguration.

Net/Alert communicates with its operators through colour-coded graphic displays and printers, in addition to disc and tape storage.

It uses three display formats. At the highest level is a summary of all network activity and status (traffic volume, response times, real time status). Below this is the group screen, providing the same information on all lines in one selected group. Finally there is the line display showing the utilisation, availability and type of every device attached to that line in an easily understood format.

In addition to these instant status reports the system provides a series of analytical reports. These include network availability, response time distribution, and performance reports for every network device from CPU to terminal and line and terminal usage reports.

These reports include comparisons over time for one element in the network as well as comparisons between separate devices. Furthermore, the system is totally flexible. It allows users to define measurement thresholds so the colour coded alert functions are geared to their own network.

The end result of Net/Alert, say the manufacturers, is a more cost-effective and responsive network, with information for day-to-day administration and longer term planning presented concisely and clearly.

Communications Accessories & Equipment (CW), Akeman Street, Tring, Herts, HP23 6AJ. Tel: (0442 82) 4011/5551.



The Genie III business package.

## Micro package for small firms

A COMPLETE microcomputer business package aimed specifically at small firms and professional businessmen, is being launched by Lowe Electronics.

For £3,250 plus VAT, the Genie III business system offers a microcomputer, printer, software programs and a one-year maintenance contract covering hardware and software.

The software pack, worth nearly £700, is made and supplied by TADS and covers sales ledger, purchases ledger and nominal ledger systems.

"We are one of the biggest selling 'computer' independent and firmly believe the Genie III to be an essential extension to our product range," said Lowe Electronics Divisional director Rob Sted.

All appointed dealers will receive training and instruction on how to get that message across," said Sted.

Lowe Electronics (CW), Matlock, Derbyshire. Tel: (0629) 2430/2817.

"This is the system for any or

organisation employing fewer than 250 people and we intend to provide a complete and efficient range of programs to suit the needs of a wide range of firms up to that size," added Sted.

Initially, Lowe has appointed 12 dealers, and intends to expand this network to at least 20 within 12 months.

"The dealers can take delivery and start selling from day one, without having to get involved in assembly or dispensing add-on parts, which should appeal to them," said Sted.

"All appointed dealers will receive training and instruction on how to get that message across," said Sted.

Lowe Electronics (CW), Matlock, Derbyshire. Tel: (0629) 2430/2817.

"This is the system for any or



Complete status and performance information "concisely and clearly" on Net/Alert.

## Preview routines added to Interactive Graphics Library

THE range of computer graphics software from Tektronix has been expanded with the addition of preview routines to the Plot 10 Interactive Graphics Library (IGL).

The new routines, available as a library module, allow a user to preview plots generated by application programs developed using Calcomp's fundamental graphics software.

The preview routines are suited to mapping, manufacturing and computer aided design markets, and provide the link between Calcomp software and Plot 10 IGL.

Any terminal supported by Plot 10 IGL can now be utilised to preview plots with the addition of the new routines.

The routines offer online inspection of drawings prior to plotting. Previewing on a high resolution graphics terminal can cut hours off the review process for the user, who can ensure that a revision is correct through close visual inspection of computer-managed drawings.

A feature of the preview routines is their compatibility with the Tektronix Plot 10 Terminal Control System (TCS), allowing

## 'World first' claim for binder

A PRINTOUT binder claiming a "world's first" has been launched by Aylesbury-based Rexel.

Part of the Rexel Wilson Jones range of data control and media management systems, the Nyrex Superflex binder can be used with most popular types of retention equipment and with nearly all sizes of burst and unburst printout.

The VTV31-K comprises a single dual height board which can be plugged directly into the host LSI-11 system bus. Using a full bit mapped display, the controller is able to address each point on the monitor screen allowing a virtually unlimited range of pictures to be displayed. A choice of up to eight colours can be selected for displaying data. Maximum resolution is 512 by 256 pixels.

Designed as a general purpose interface between processor system and monitor, the controller is available with options that allow it to be used with low-cost, low-resolution TTL monitors or with higher resolution RGB monitors.

Rexel has introduced a binder carry handle to make the handling and filing of bulky binders a little easier. Formed from flexible black plastic with a useful index area, the handle slides simply into the binder for carrying.

Both Nyrex Superflex binders and the Carry Handle are featured in a new 25-page A4 full colour catalogue, which documents in full the Rexel Wilson Jones range.

Rexel (CW), Gatehouse Road, Aylesbury, Bucks, HP19 3DT. Tel: (0296) 81421.

## Daisy wheel advance

ONE of the greatest limitations of the daisywheel printer is the restricted number of characters available on a single printwheel. Some attempts have been made to overcome this, employing two printwheels operating from different ends of the same printer on a single printer, but this technique has never been totally successful.

Zygal Dynamics now announces the Diablo Model 630 ECS daisywheel printer that can run a wheel containing 192 complete characters and part characters which can construct over 400 different characters. A standard wheel will produce the complete international information transmission set (Teletext).

In word processing environments the ECS allows operating with single sheets "posted" into the printer.

Zygal Dynamics (CW), Zygal House, Telford Road, Bicester, Oxfordshire, OX6 0XE. Telephone: (0425) 617477.

The Nyrex Superflex printout binder, with the binder carry handle.

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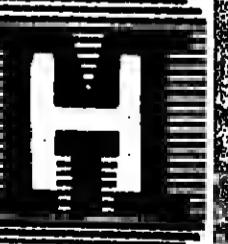
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## KIRKLEES Metropolitan Council

**Directorate of Finance**  
**OPERATIONS LEADER (Expanding ICL 2960 installation)**  
Grade PO11-5 - £8,991-£9,933 p.a.  
We seek a person with a considerable experience at a senior level in Computer Operations, who is capable of accepting and discharging a high degree of responsibility for staff, schedules, performance and user service.

The experience should have been on an ICL 2960 installation, preferably using VM/IE. The postholder will be primarily responsible for co-ordinating and supervising the functions of Control, Data Preparation, and the Computer Room, during the installation. The postholder will be involved in closely supervising a computer installation which is supporting an extensive TP network and database facilities, which are expanding into many areas of the Authority's activities; therefore applicants should have had extensive experience of this type of mixed mode working.

Informal enquiries may be made of Keith Walton, Operations Controller, Tel: Huddersfield 21133, Ext. 591.

### PRINCIPAL INSTALLATION OFFICER

Grade S02 - £8,991-£9,933 p.a.

This is a new post within the Computer Division and has been created as a result of the authorities' expansion into the areas of Distributed Data Processing and Utilities. Available to the Computer Manager for the ICL 2960 installation.

The postholder will be responsible to the Computer Manager for the specific implementation and upkeep of hardware and software to be installed at various locations throughout the authority.

Duties include:

Specification of hardware and software requirements

Development of specifications with suppliers

Co-ordination of production arrangements, including equipment procurement and training

Implementation of hardware and software to specification

Creation of control and security procedures

Co-ordination of systems development

Analysis of approved developments

System maintenance and upkeep

Development of user documentation

Applications are invited from persons with a minimum of 5 years' computer experience, ideally gained in a variety of roles including operations and development. A minimum of 2 years' systems analysis experience would be an advantage.

Informal enquiries may be made of Neville Hayle, Tel: Huddersfield 21133, Ext. 323.

For application forms for the above two posts please contact Mrs. G. Lightfoot, Tel: Huddersfield 21133, Ext. 305, which should be returned to Mr. P. B. Sherman, Director of Finance, Civic Centre, Huddersfield HD1 1AF by Thursday, 12th August, 1982.

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Growth of 100% per annum demonstrated the forward-looking expansion of this major U.S. manufacturer. This growth has led to important training within the U.S. and European early production will allow you to earn if you can demonstrate computer experience and relevant attitude to work.

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Our client, a major U.S. mini manufacturer with over 20000 installations worldwide, is offering exciting career opportunities in London, Home Counties for students or ex-engineers. Comprehensive product training on an extensive range of high performance systems will be offered. An excellent package of benefits including relocation where appropriate.

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Leading micro computer manufacturer in the U.S. offers unrivalled career opportunities in micro software, component level AYPs, software development and field service training coupled with superb working conditions under a client base in excess of a million.

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ALTRONICS PEOPLE (AGY)

103581

# CICS/DL1

City of London

## Design and Support

Manufacturers Hanover Trust is the fourth largest American Bank, with headquarters in New York and facilities in 40 countries world-wide. International banking systems are developed here in London. The salaries indicated below are enhanced by generous banking benefits, including 5% MORTGAGE. In addition to all the technical skills required for these positions, we are looking for friendly, able communicators with good oral and written abilities.

### Team Leader c £15,000

We are looking for a Team Leader with in-depth knowledge of CICS and DL1 - both in the areas of application usage and system software - and involvement in the design and planning of an IBM real-time application system. A good knowledge of COBOL, and IBM Assembler will also be required. You will be responsible for the provision of CICS/DL1 design guidance to application and technical development teams, and for teleprocessing problem investigation and resolution in an advisory capacity. You will also assist in the planning/provision of development and testing environments, and the design and testing of CICS software.

### Senior Programmers c £11,000

We wish to fill two positions. One senior programmer will work with the Team Leader described above, in TP Design and Support. The other will work on TP development. Responsibilities for both will include the specification and development of CICS/DL1 related software. Good experience of CICS/DL1 programming is required, together with COBOL (some IBM Assembler experience would be useful). Our environment is IBM 4300, VM/CMS, DOS/VSE, VSAM.

### Programmers c £9,500

This is a good opportunity for an experienced DL1 programmer, with COBOL and/or HAL, to become involved in database design while providing programme support to the Database Development Group.

Please contact Joan Ainsworth on 01-600 5666, extension 3533 or write to her at Manufacturers Hanover Trust Co., Queensbridge House, 60 Upper Thames Street, London EC4V 3EN.



developing the banking systems of the future

### Freelancers . . .

... in the North of England and Scotland who are available now or in the near future are invited to contact me, Peter Moore, to discuss a variety of interesting and rewarding assignments throughout the UK and overseas.

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### Computer Equipment Supervisor

to £7,500 - Central London

Logica, one of the UK's leading software and systems companies, needs an equipment supervisor for company-owned computer systems used for multi-user environments, including supervision of installation, operation and maintenance of such equipment and will work closely with suppliers and Logica staff.

PE

At least two years experience in the administration of computers and other electronic equipment in a multi-user environment, including supervision of installation, operation and maintenance.

For an application form please contact

Tricia Owan, Tel: RPI, Logica Limited, 64 Newman Street, London W1A 4SE. Telephone 01-537 9111.



## CONTRACT ASSIGNMENTS

At Abraxas we need reliable and professional Systems and Programming people to join our Contract Team. Skills of particular interest include:

### LONDON & HOME COUNTIES

#### IBM PL1 + or DATABASE

IBM PL1 CICS

IBM OS COBOL

IBM JACKSON COBOL

IBM IMS DL1

IBM MARK IV IMS

IBM IMS ADS

IBM COBOL CICS

IBM COBOL CICS DL1

IBM SYS 34 HPG11

IBM 8100 DPPX COBOL

IBM COBOL VM DOS VSE

IBM ADABAS + or NATURAL

IBM DOS TOTAL ENVIRON 1

IBM VM CMS EXEC

#### IBM PL1 JACKSON

#### OTHER URGENT REQUIREMENTS INCLUDE

#### ICL 2900 IIMS + or TP

#### ICL 2900 TPMS DESIGNER

#### ICL ME29 TMG TP COBOL

#### HP 3000 COBOL

#### CPM MICRO BASIC

#### PDP ALIMS

#### PRIME COBOL

#### H66 IDS TDS COBOL

#### PDP RSX11 MACRO 11

#### PDP RSX11 BASIC + 2

#### PDP RSX11 FORTRAN

#### DOCUMENTATION ANALYST

#### UNIVAC 1100 IMS COBOL SYS

#### X GEORGE 3

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For more details and a confidential discussion of your needs contact CLAIRE or LYNN of our CONTRACT RESOURCES - TODAY on

01-388 2061

ABRAXAS

(Computer Employment Limited)

307 Euston Road London NW1 3AL

RECRUITMENT CONTRACTING CONSULTANCY

The people we are seeking will also have a good education and mature personality. They will have experience of at least one high level language and would probably have been working in a similar environment. A proven understanding of the application of modern computing techniques in either the Technical or Commercial spheres is essential.

The standards we set are high so naturally we offer an excellent remuneration package; additionally the position could merit a car.

Please telephone Mike Cornelius on Newbury (0835) 31486 or if you prefer write enclosing a c.v. to

Norsk Data Ltd., Nord House, Pelican Lane, Newbury, Berkshire, RG13 1NU  
Telephone: Newbury (0835) 31488 - Telex: 849818

# Contract Professionals

## The Agency Alternative

As a contract professional you are obviously aware that many companies rely very heavily upon contract staff, perhaps in Data Processing and Computing more than any other field.

Previously – the only major recognised link between companies seeking contract personnel and the contractor offering technical or intellectual skills and expertise was the agency.

Now – there is a new channel of communication enabling you to make direct contact with the companies looking for the specific skills that you can provide.

The Irex Clearing House is a membership network, a division of Ideas and Resource Exchange Ltd, specifically devised to effect introductions between members who have compatible needs and interests.

We store the detailed information that you provide about your services and capabilities for immediate recall and matching against user members' requirements.

Over a thousand of the top industrial and commercial concerns in the UK have the use of the Irex computer to search through its databanks to find members who are offering the services they require.

NAME ADDRESS	EVENINGS
TEL NO: DAYTIME JOB TITLE	GW
<b>irex</b> Irex Clearing House, Ideas & Resource Exchange Ltd., Snow House, 103 Southwark Street, London SE1 0JF.	

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## EXCELLENT CONTRACTING OPPORTUNITIES

Our immediate domestic and international consulting needs are detailed below. If you are of a professional disposition, skilled and dedicated, and wish to join our permanent or contract staff, please contact us in respect of these and future opportunities.

### INTERNATIONAL

PL/1 CICS  
ICL 2000  
S/38, RPG 111  
COBOL or PL/1  
IMS DB/DC  
COBOL, CICS and/or ADABAS  
MARK IV

Programmers  
All Levels  
Programmers/Analyst  
Programmers  
Analysts  
Programmer Analysts  
Analyst Programmer

USA  
Belgium  
Europe

### UK

COBOL, IMS/DB  
and/or IMS/DC  
COBOL/DBS  
COBOL, CICS OL/1

RPG 111, S/38  
RPG 111, DBS or COBOL  
Rodin

COBOL, HP3000  
COBOL, ADABAS  
MARK IV

### PRIME

### NOMAND

For more information please contact:

Resources Department  
TARGET COMPUTER SERVICES  
102/108 South Street  
Romford, Essex  
Tel: Romford (0708) 780201  
(24-hour answering service)

(0308)

### TECHNICAL AUTHORS

We are a well-established and fast-growing group in the Communications Industry. We are looking for Technical Authors experienced in Software documentation, to work on existing and future contracts ranging from Systems Software for personal computers to advanced CAD packages. Please write with C.V. to:

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Nottingham NG7 4DT

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Small Software House specialising in CAD.  
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### TEAM LEADER

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Ready for the next step in your career path. Read on! This company is highly regarded and will give you the opportunity to get involved from development to sales and management. The requirements are IBM/COBOL/DATABASE/REAL TIME covering at least one of these, plus a high level standard of software. The job offers responsibility, challenge and variety! Sound interesting? CALL US NOW!

### ANALYST/PROGRAMMER

LONDON

Our client, a leading financial organisation, would like to recruit an Analyst/Programmer. The requirements are a minimum of 1-2 years experience in a systems environment, plus a good knowledge of COBOL and/or PL/I. A minimum of 1-2 years experience should be offered. You will have the opportunity to work within its large custom-built software division which uses IBM mainframes backed up with use of mini. A good career path and a stable working environment also accompany this position.

### PROGRAMMER

BEDFORDSHIRE

Away from the bustle of town this financial company is seeking a programmer to add to its team. You should have a minimum of 1-2 months' programming experience, preferably within an IBM site, although consideration will be given to applicants with other hardware experience on a COBOL/Financial system.

For these programming vacancies call Lynda on 01-242 0078 or 01-404 4336.

### PERMANENT JOBS BASED IN FLORIDA AND SAUDI ARABIA

INTERVIEWS IN LONDON, ODEG ESSENTIAL

SYSTEM PROG: IBM or CICS on an MVS or OS/VS1 SITE, CICS and ADV1.

PERMANENT ANALYST: IMS or another DATABASE, COBOL, MVS or OS/VS1 SITE.

PERMANENT ANALYST: COBOL, MVS or OS/VS1 SITE.

SALARY: \$26,000 to \$36,000 + EXCELLENT PACKAGE. Send resume to:

Meggle/Lynda.

Range 1A: £28,076-£19,875 or

Range 2A: £32,760-£21,562 or

The position is available for one year only from 1st September 1982.

Appointment for this post will be at an appropriate point on the Range 1A scale, subject to age, qualifications and experience.

Further particulars may be obtained from Mrs. Meggle, Manager (P.R.), The University, 10 Kesteven Street, Newcastle upon Tyne, NE1 2BL, with whom applications (3 copies) should be lodged not later than 20th August 1982. Please quote reference CW.

(0308)

COMPUTER SERVICES  
Recruitment Consultants

(0308)

### Advantages of the Clearing House:-

- You can agree your own terms of contract directly with the user, free from third party involvement or fees.
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- You are free to contact any member company seeking your skills.
- Your details are never sent to any user until you have given your permission, so the service is completely confidential.
- You are assured of being accurately presented to your chosen users because you write your own profile.
- The service is extremely fast.

Currently, our members have urgent requirements in many areas of Data Processing and Computing. We also operate in a number of other disciplines including Finance and Accountancy, Engineering and Management Consultancy.

For further information about the Irex organisation and for details of membership of the Clearing House, please call John Edwards on 01-261 1543 (24 hours) or send him the completed coupon below.

**irex**

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# Systems Development Manager

## Salary and benefits in excess of £20,000

Excellent financial results coupled with exciting growth potential have been the result of decisive and dynamic management at LRC Products Limited, part of the LRC International Group. To assume responsibility for the development and ongoing maintenance of computer based systems, which play a major role within the Company's management, an articulate and experienced Systems Development Manager is being sought.

Controlling and motivating a sizeable staff, who utilize the resources of an IBM 4341 with an established on-line data base, will feature prominently in the successful candidate's day-to-day responsibilities. Of necessity, he or she must possess the personality to be an able planner and organiser, be capable of dealing with several priorities simultaneously and provide inspirational leadership via practical ability.

Combining the qualities of both achiever and theorist, an IBM background and proven demonstrable experience in a similar capacity, ideally, but not necessarily, gained in the fast moving consumer goods or allied industry, would be highly advantageous. The planning and implementation of a variety of projects to set timescales, effective liaison at various levels, business acumen, the capacity to implement new systems that generate optimum benefit in a fast changing business environment coupled with an in-depth knowledge of information processing development and techniques are also essential prerequisites.

Based at Chingford, the selected applicant will report to the Director of Management Services and Distribution, but will have the freedom to control most aspects of systems development. The salary and executive car offered amply reflect the importance of the position. The benefits package includes an annual bonus, non-contributory pension scheme, free life assurance, BUPA and re-location assistance where applicable.

Applicants, male or female, should write initially to Richard Leslie, Personnel Director, at the address shown below, including a comprehensive c.v.

**LRC**

LRC Products Ltd  
North Circular Road  
London E4 8QA

**logistix**

Logistix Recruitment Limited  
10 Grenville Place, London SW7 4RW

Telephone: 01-373 3063

### Financial Consultants

Central London: Salaries to £15K

The financial division of a leading City-based Systems and Software House currently requires additional Consultants. Suitable applicants will be graduates with a minimum of five years' experience within either a Financial Institution or Management Consultancy. In particular you should offer a knowledge of one or more of the following: automatic tellers, electronic funds transfer, commodity systems. All applicants should have been involved in the design and development of at least one complete system and preference will be given to those who have led a project team or who demonstrate management potential.

Ref. L30/4

### Micro Design Engineers

Wilts/Avon: Salary to £10K

A number of Micro-Processor Design and Development Engineers are sought by a leading micro-computer and semi-conductor manufacturer. As there are a considerable number of positions available, the variety of skills required is, necessarily, diverse. However, experience in one or more of the following areas is essential: customisation of Operating Systems such as CP/M or MP/M, with a salary premium attached to

Ref. L30/4

### VAX Progs/Designers

London & E.E.C.: Salaries to £15K

A leading International Company specialising in the development and sale of communications software is seeking Programmers and Designers for its Central London and overseas facilities. Suitable candidates should hold a numerate degree and have two years' subsequent programming or system design involvement. Fluency in Fortran is essential and it is preferable to have had

Ref. L30/4

### Flexible Manufacturing Systs.

Bucks: Salaries to £10K+

Systems Programmers, with substantial experience of micro-based systems, are required by a leading supplier of computer controlled machinery. Suitable applicants will be graduates in a scientific subject, preferably Electrical or Electronic Engineering, followed by two years in an industrial environment. At least three years' experience gained on a 16-bit micro-processor is essential, with a preference for those who have particularly

Ref. L30/4

### Micro Assembler Progs.

Greater London: Salaries to £9K

A number of Systems and Applications Programmers with at least 12 months' post-graduate experience are sought by an expanding total systems supplier. All applicants should have worked on an 8- or 16-bit micro-processor system and be fluent in an assembly language. Applications Programmers will be expected to develop bespoke software and tailor existing packages for the company's

Ref. L30/4

### Data Communications

South Midlands: Salary to £15K

A highly regarded supplier of Hardware and Software Systems is seeking a number of Data Communications and Networking Engineers for its Research and Development facility. Suitable candidates will currently be employed in a development capacity with either a Systems House or Manufacturer. Particular technical skills should include at least two years' programming experience of a high level language such as Pascal or C and preferably in, addition to some practical

Ref. L30/4

**LOOK**

## URGENT FREELANCE ASSIGNMENTS

We have a number of clients urgently requiring freelance Programming Staff with:

IBM COBOL, CICS – 10 requirements, 6 months +, Home Counties.

INTEL 8086, ICE, PL/M – 6 months, South Coast.

TANDEM – All levels, 6 months, Middlesex.

IBM SYSTEM 38, RPG III – 3 months, West Country.

IBM COBOL, VM/CMS – 3 months, West Country.

IBM PL/I, CICS – 12 requirements, 6 months +, various locations.

VAX COBOL or BASIC – 6 months, Home Counties and West Country.

COPICS – 8 requirements, 6 months +, Southern England.

Telephone FARNBOROUGH (0252) 516141 or

write enclosing a detailed C.V. to:

Trident Computer Services, PLC

Trident House

38/44 Victoria Road

Farnborough, Hampshire GU14 7UD.

(0308)

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## FREELANCE OPPORTUNITIES

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APL Programmers  
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Analysts with Life Assurance or Financial background  
Analysts with various Systems  
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UNIVAC 90/30 OS RPG II  
IBM Adabas Analysts/Programmers  
IBM COPICS  
IBM OS COBOL  
IBM COBOL, CICS & DL1  
IBM PL1 Various requirements  
IBM B100, DPXX, DPX, COBOL  
IBM SYSTEM 34, RPG II  
IBM 4300 RPG II  
IBM COBOL, CICS & OPAC  
IBM CICS (DMS)  
IBM IMS DB/DC PROGRAMMER  
SYSTEMS DESIGNERS  
IBM CMS COBOL  
IBM CICS, VTAM, COBOL/ASSEMBLER  
IBM MARK IV  
IBM PL1, SHADOW  
IBM System Programmers VM/CMS  
IBM MVS COBOL SHADOW IDMS  
IBM Assembler on-line DATABASE & TASK MASTER  
IBM SYSTEM 38 RPG III  
HONEYWELL DPS4, IPS, COBOL  
HONEYWELL DPS8 COBOL PROGS  
ICL ME29 COBOL  
ICL VME, IDMS  
ICL SYSTEM 10 ASSEMBLER  
ICL SYSTEM 25 ASSEMBLER  
PDP RSTS/E BASIC + or BASIC + 2 (some with DB2000)  
PDP RSX11/M BASIC + 2  
VAX BASIC  
VAX SYSTEL  
VAX COBOL  
HP3000 COBOL  
WANG COBOL or BASIC  
FORTRAN PROGRAMMERS  
PASCAL PROGRAMMERS  
TANDEM any levels (URGENT)  
CORAL 68  
VENTEK DATAPORT, DATABUS  
DATA GENERAL INFO/COBOL  
INTEL B086, MDS, ICE, MTOS, PLM Programmers  
VARIAN V77 COBOL, ASSEMBLER  
Hardware Engineers  
ABS Multibus Simple  
SMI CMC REALITY packages  
SYSTEM X SOFTWARE ENGINEERS  
Contact: STEVE WHITING, NEIL SMITH,  
STEVE CASEY, DEREK WADHAM, DAVE PEART, DAVE  
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URGENTLY REQUIRED  
IBM PL1 or COBOL PROG/ANLIS  
Preferably with OS MVS, TSO/SPP  
IMS, DB/DC 6-month assignments starting August 82  
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### HOLLAND

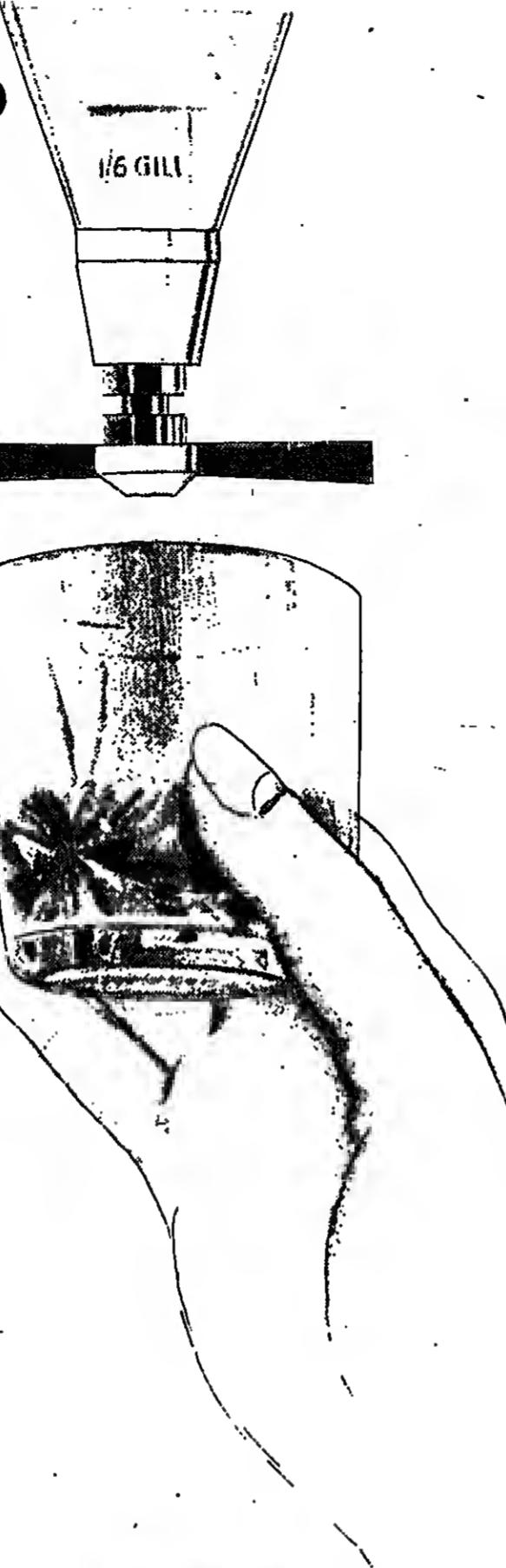
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PDP RSX11/M BASIC + or BASIC + 2  
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FORTRAN PROGRAMMERS  
OS MVS CICS JCL WRITER  
ICL VMEB COBOL IDMS or TPMS  
ICI VME OPS  
Contact: NEIL E. SMITH or  
KAREN LONGCROFT

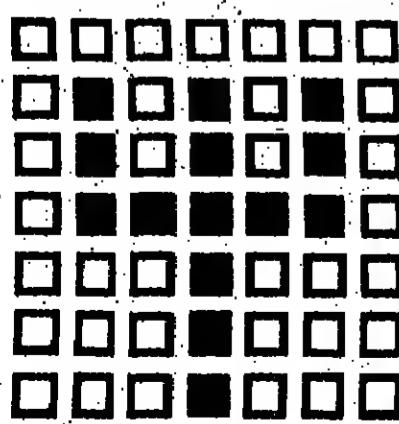
IBM Analysts and Programmers  
COBOL, DL1, CICS - SOUTH AFRICA  
IBM Sys 34 RPG11 A/PS Surrey to £11K  
(Retraining will be given on RPG III)  
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ANALYST PROGRAMMERS  
Any commercial experience, various locations,  
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Excellent salaries plus relocation.

For further advice on these career moves contact Peter Joseph  
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BIRMINGHAM B26 3PS  
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## Computer Manager (Technical Systems)

**Saudi Arabia** £18,000 Tax Free  
(Family or Single Status)

Our client is Marine Transport International Co Limited, a joint Saudi Arabian-British company, who, on behalf of and in conjunction with the Saudi Ports Authority, manage and operate the container terminals in the fast expanding port of Jeddah.

Extensive use is made of advanced technology and the array of computing equipment includes 2 PDP 11/70's and a number of microcomputers.

The objective is to completely computerise the terminal which will involve the development of a number of real-time systems.

The Computer Manager will:

- manage the computing department
- manage and participate in the development projects
- liaise with hardware/software suppliers and the Port Authority

The successful candidate will have a degree together with a background in industrial/technical systems. Additionally, the candidate will have systems experience on PDP 11 computers, preferably operating under DSS II or MUMPS.

In addition to the quoted salary, a generous living allowance is paid, transport and free furnished air-conditioned accommodation are provided. Other benefits include generous leave, BUPA, NHI, Medicare and excellent recreational facilities. The position is available on either family or single status.

For more details, please contact Andrew Cousins quoting Ref: N163.

**Lloyd Chapman  
Associates**

123, New Bond Street, London W1Y 0HR 01-499 7761

URGENT

## YOUR IMMEDIATE ATTENTION IS REQUIRED

Dear Contractor,

REF: HPSL'S FIRST-EVER SPECIAL RAFFLE  
The glad tidings of our proposed raffle, for a micro computer, appears to have travelled far and wide. A number of anxious would-be participants have contacted us to say that they have not received the details of entry to the competition. We can only assume that the recent happenings on the railway, or perhaps the postal services, have conspired against us in this matter.

If you did not receive an original letter of invitation and wish to be included in the draw, please forward your CV at once marked "Micro Computer Draw" or contact the office for an abbreviated form and then:

HURRY THE COMPLETED FORM TO US FREEPOST

In order to give all interested entrants to the raffle a fair chance, we have agreed to hold over the draw of the lucky winner until September.

The winner's name will be announced in all our press advertisements in that month.

Contact with the winner will, of course, be made by telephone or telegram immediately the draw has taken place.

For your information, the micro computer chosen for our draw is the VIC-20 Colour Computer - a very handsome prize you'll agree - so rush your curriculum vitae to us

FREEPOST HASTE

Good Luck

You're sincerely  
H. PROGRAMMING AND SYSTEMS LTD.  
JAMES T. BARKER

PS: Please tell your colleagues about our draw, because your name can be entered for the draw for more than once by getting any of your colleagues who are not already registered with us to do so. Any new name will also qualify for the raffle together with the name of the individual who introduced them. No restrictions are placed on the number you can recommend.

PPS: Please make sure you include your name, address and telephone number on your form.

Please reply to:

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AMERSHAM  
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(0494 50000)

# OCC WHERE YOUR APPLICATION COUNTS FOR MORE

Now is the time to consider your future and enlist our help in finding the right position for you. We have many interesting, well-paid opportunities for men and women, with an increasing number of requirements in most functions but particularly for software/application programmers and systems personnel.

## BUSINESS SECTOR MANAGER

London

to £15,000 + Bonus + Car  
Leading independent London software house offers last promotion prospects within Advanced Systems Division. Applicants should have a technical background with some knowledge of aerospace applications, C.A.D., graphics and simulation. Some sales experience and budgeting would be a distinct advantage. W489/MB

## PROGRAMMERS, ANALYST/PROGRAMMERS & CONSULTANTS

London

It is difficult to be successful over a wide range of computer services but our client has been so, growing by more than 35% p.a. over the last five years. Growth that has created many sound, career opportunities NOW, particularly on financial projects for London clients.

PROGRAMMERS: RPG II or III, £8,000 to £10,500. Sound experience of two years or more ideally on IBM Systems 34 or 38 but training on either processor is available with the Group's own excellent resources. W495/B

ANALYST/PROGRAMMERS TO CONSULTANTS: £10,000 to £16,000 + with car. Solid systems skills in IBM environments are ideal for major projects on INSURANCE and BANKING with posts available at all levels. Specific application experience in either area is only necessary for the more senior positions. Company cars are provided at these higher levels. W496/B

## ANALYST/PROGRAMMER

London

to £11,500  
IBM user - doing my present role. We are looking for a suitable person to join our team of analysts and programmers in our London office. Good experience of IBM systems required. W497/B

## SENIOR PROGRAMMER

Crawley

to £10,000  
IBM user - experienced in mainframe and mini environments. Good experience of IBM systems required. W498/B

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Candidates are invited to apply in English giving full details of education, training and experience supported by copies of relevant certificates separately to both the following addresses, not later than 3 weeks from the date of publication:

1. Senior Personnel Officer (CPA)  
P.O. Box 303,  
Abu Dhabi, U.A.E.
2. Department of Petroleum,  
P.O. Box 9,  
Abu Dhabi, U.A.E.

Knowledge of Arabic will be an advantage. Any applications which fail to comply with the above will be disregarded.



(0348)

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(0438)

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(0181)

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Kendall Globe Limited are Travel Agents and Freight Forwarders with 200 employees and a current annual turnover of about £30 million. A period of considerable expansion is planned and the company is near to completing the computerisation of its accounting system, based on an ICL System Ten computer.

The company wishes to appoint a Computer Operations Supervisor for the following role:

1. To control, operate and maintain its ICL System Ten computer system, aided by one assistant.
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The salary is £8,300 p.a. plus non-contributory pension scheme and BUPA cover.

Applicants should submit full career details to date to: Mr A. R. Rosenberg, Financial Controller, Kendall Globe Limited, 35-37 Alfred Place, London WC1E 7DY.

(020)

## Lombard Elizabethan Insurance Plc

are looking for an  
**Experienced Data Processing  
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Applicants should have experience in the insurance industry, should have developed and implemented major on-line systems and should have management experience. Practical knowledge of COBOL, IFS and IDMS software and ME29 or other ICL equipment would be a significant advantage. No one with less than 5 years data processing experience should apply.

Excellent fringe benefits.  
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The main function of these positions include working on new developments/modifications in a small team environment. It will include analysis and programming in high level languages for real-time banking and part for Arbat's clients' systems.

The up-to-date nature of the product environment demands the use of high quality DP technical staff.

Applicants will preferably be experienced in the following areas:

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- Funds transfer applications
- Basic and/or C language programming
- DEC PDP or VAX hardware and operating systems

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Applicants will already design and program to a high standard and be looking to work in a friendly and professional environment.

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## BENEFITS

All positions offer excellent career openings in a successful, dynamic and expanding company.

All necessary travel, visa and accommodation arrangements will be undertaken by Arbat for the overseas appointments, and all UK and overseas appointments carry excellent salaries which are regularly reviewed on merit.

To receive further details and an application form, telephone the number below, or return the coupon at your earliest convenience, using the Reprint service.

Please send an Application Form and Company Profile to:

Recruitment Consultants 0434

Surname \_\_\_\_\_  
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PPD 11/44 (RSTS)

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(01)

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With some three years' COBOL experience, you will have knowledge of ICL, VME, SCL and TPMS.

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At least 18 months - 2 years commercial or production systems experience is essential, preferably gained in an on-line installation. Ref: FY.1.

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At least 2-3 years experience of COBOL is essential, preferably gained in an on-line installation. Ref: FY.2.

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To operationally evaluate new products, provide technical help to users, assist in the development of communications network. Proven experience of ICL

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Applicants should be qualified to HND level and have substantial experience in this field. A knowledge of IBM equipment, programming systems and assembly programming language is essential.

Application forms are available from the Personnel Unit (Tel: Telford 805051 Ext 451) and should be returned to the Personnel Manager, Multisites House, Telford, Shropshire TF3 4LD not later than 12th August 1982.

(0441)

## District of the Wrekin

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Brentford, Middlesex TW8 9AB

Box number replies should be addressed to:

UNIVERSITY OF ESSEX  
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## Micro-Processor Systems Engineer

Applications are invited for a post on Micro-Processor Systems Engineer in the Department of Computer Science (Computer Services) at Computer Officer Grade 1A (01070-010576).

The duties of the post will include the design, development and maintenance of specialist hardware and software and the provision of consultancy services in both hardware and software aspects of micro-processors to users throughout the United Kingdom. The postholder will have a degree in Computer Science or the hardware side or similar qualifications and relevant experience.

The successful candidate will be expected to contribute to the general work of the Computing Service and will be responsible for a small group reporting via its manager, to the Assistant Director of the Computing Service.

Applications (Job copies) including a curriculum vitae and the names and addresses of two referees should reach the Registrar, (tel: 01070-01411) University of Essex, Wivenhoe Park, Colchester CO4 3SQ. Further particulars may be obtained by 10 August, 1982.

(0420)

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(0117)

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Enclosing details of qualifications and experience.

(0441)

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Suitable candidates will possess a degree in computer science or equivalent qualification and should have a good working knowledge of UNIX and C or PASCAL. Experience of any of the following would also be of interest: PDP 11, LS11, VAX, PRIME, networks, DBMS, management information systems, toxicology, signal processing, and biomedical research. A working knowledge of French language would be useful but it is by no means essential. E.E.C. experience would be an advantage. Applications accompanied by a curriculum vitae will be treated in strict confidence and should be sent directly to: LERS, Direction Administrative et Technique, 58-60 rue de la Gélatine 75013 PARIS - FRANCE.

Box Number...  
c/o Computer Weekly  
Quadrant House  
The Quadrant  
Brentford, Middlesex TW8 9AB

Box number replies should be addressed to:

(0117)

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## SYSTEMS PROGRAMMER

Applicants should have a detailed knowledge and experience of ICL's 2900 Operative System, SCL, Super-Structure Products and Hardware. ETE operates two ICL 2956 computers. The operating systems are OME2, VME 2900 and CME. RTE also uses IOMS and IDMSX, with ICL's Ode Dictionary System. Workloads are both Batch and On-line, with programme development under MAC.

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IR pound 10,252 to IR pound 14,521 per annum.

IR pound 10,765 to IR pound 16,247 per annum.

(from 15th September 1982).

Postcards, requesting application forms, should be sent to:

PERSONNEL ADMINISTRATION MANAGER  
RADIO TELEFIS EIREANN  
DONNYBROOK  
DUBLIN 4  
IRELAND

Closing date for receipt of completed application forms - Friday, 13th August, 1982.

(0442)

## SYSTEMS ANALYST

Norton Keynes

This is a challenging position involving the investigation into existing systems, with the object of modifying them when necessary and implementing new approaches.

Candidates should be educated to degree level or equivalent, with 2 or more years relevant practical experience of business systems in a commercial environment.

Salary is negotiable. Company benefits include 5 weeks annual holiday, subsidised car and contributory pension scheme.

Please write with full p.v.c. to:

David Barnes

British Standards Institution

101 Churchill Road, London NW1 2DB

(0117)

## Pascal Programmers

London

£7,000 to £12,000  
+ Benefits

This newly formed and rapidly expanding software company are involved in M.I.S. package development and econometric modelling.

Utilizing the new generation of 16-bit micros linked by local area networks, you will be involved in the development of conceptionally new products thereby unleashing the power of this new machinery to the user.

Applicants should have a good grounding in PASCAL together with one or more of the following:

- \* File Handling
- \* Graphics
- \* Compiler/Interpreter writing
- \* 8080 Assembler

Recently qualified graduates who feel they can work in a technically demanding environment should also apply.

Please Contact: David Hendry

Ferguson Thorley Bowles Associates Limited  
International Personnel Consultants  
15 Clarence Street, Slaines, Middlesex TW18 4SU  
Telephone: Slaines (0784) 59247. Telex: 881418

(0441)

## Hampshire Based Systems House

Our Client is a rapidly expanding systems house specialising in the development and implementation of interactive systems for the industrial sector.

With sophisticated, high quality products they are set to accelerate into a significant market position.

They are building dedicated teams of career-minded professionals:

## Project Managers

To £15,000+Car

Possessing approximately eight years of broad data processing experience, covering programming analysis, design and implementation preferably of manufacturing applications; your responsibilities will cover the total system from feasibility to implementation.

Essential requirements include experience with man management, project co-ordination, client liaison and the ability to work to deadlines within budget.

## Senior Programmers

£9,000-£11,000

A minimum of three years COBOL programming on any computer hardware is essential plus some knowledge of manufacturing systems. Equally important are program design and documentation of on-line applications and the ability to be effective in a project team environment.

A first class benefits package is offered in addition to the excellent starting salaries.

Please contact:

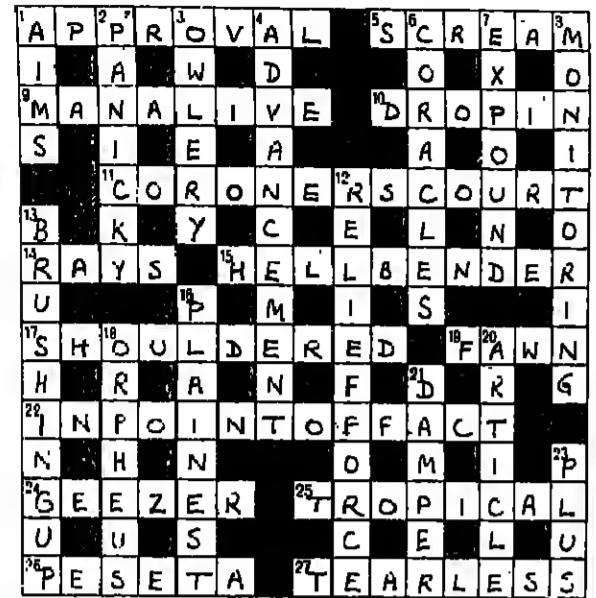
David Hendry

Ferguson Thorley Bowles Associates Limited  
International Personnel Consultants  
15 Clarence Street, Slaines, Middlesex TW18 4SU  
Telephone: Slaines (0784) 59247. Telex: 881418

(0441)

**CROSSWORD**

Solution to Prize Crossword No 30



O&M analyst Michael Carter of National Mutual of Australasia's London branch wins our £10 prize this month. Runners-up Pamela Smith, a programmer with RNSD Copacabana, and John Brooke, senior programmer with Cannon Assurance in Wembley, Middlesex.



Southampton

THE

UNIVERSITY

DEPARTMENT OF ELECTRONICS

The Department of Electronics has been awarded a substantial research contract by the Ministry of Defence to develop a compiler for VLSI digital system design. In the first instance, this project will run until October 1982 and includes support for a full-time Research Fellow.

The successful candidate is likely to possess considerable experience in one or more of the following areas:

Compiler design  
VLSI system design  
Computer system design  
Logic simulation  
Software engineering

Extensive computing facilities are available including a distributed network at Motorola 88000 computers.

The salary scale is Research Fellow Grade 1A, £6,079 to £10,578.

Applications (two copies) giving date of birth, details of qualifications and experience together with the names and addresses of three referees should be sent to Mr T. Bestall, Electronics Department, The University, Southampton, SO9 5NH. (0372)

**PSION**  
**MICROCOMPUTER PROGRAMMERS & ANALYSTS**  
Psion is a rapidly growing microcomputer software house. We require creative, skilled and able programmers and analysts. Applicants should have experience of assembly language and machine code on one or more microprocessors. This is an exciting opportunity to work with a dedicated team in Central London in the fastest-growing area of computers. Salary range £8,000 to £13,000 per annum depending on skills, experience and creative potential.

**PSION LTD**  
2 Hunsawth Mews, Gloucester Place, London NW1  
Telephone: 01-723 8919 or 723 9448 (0340)

**Leicestershire**  
**TECHNICIAN Computing/Electronics**  
Educational Computing Centre, Tel: 0533 8333  
Salary £23/£3064 - £3333

I am seeking a key role in the running of the newly established educational computing centre. Duties include demonstrating, setting up, and servicing educational computing, a difficult task which usually requires a computing or electronics background with qualifications of HND or equivalent level.

Further details on receipt of a.s.o.  
Apply (in form) giving full details, names and addresses of two referees and enclosure s.a.s. to the Director of Education, County Hall, Glenfield, Leicester by 10th August.

EQUAL OPPORTUNITIES POLICY. Applications are welcome from suitably qualified and experienced people regardless of race, disability, sex or marital status.

NatWest Jobs

**Data Processing Support Staff**

National Westminster Bank offers opportunities to join a team which supports computer systems running on the latest IBM hardware (3081) in an MVS-SP/IMS environment.

We have a limited number of vacancies in our Operations Technical Support Group at our London Computer Centre, Alie Street, near Aldgate, where our installation is currently servicing a large number of systems including an extensive teleprocessing network.

Applications are invited from candidates who have experience in JCL/Utilities and software related to high technology equipment, together with proven skills in the implementation of new systems.

Dependent upon experience, a salary in the region of £7,580 including London allowances is envisaged, together with an attractive range of company fringe benefits.

To find out more please write or application form to: Miss J. Coles, National Westminster Bank PLC, Recruitment Shop, P.O. Box 165, Heron House, 325 High Holburn, London WC1.

**UNIVERSITY OF HONG KONG**  
**LECTURESHIP IN COMPUTER STUDIES**

Applications are invited for two posts of Lecturer in Computer Studies.

Candidates should have a higher degree in Computer Science, Preference will be given to those with experience or interest in computer systems architecture, computer networks, operating systems, performance analysis, computer system and systems analysis and design. The applicants will be required to lecture as well as to participate actively in research or development. The post is on a three-year contract with a probationary period of one year.

Annual salary (unreduced) will be an 11 point scale HK\$129,840.

217,396 (1) to 313,170 (20 approx.).

Starting salary will depend on qualifications and experience.

At current rates, salaries will not exceed 15% of gross income. Housing benefits in a rental of 71% of the cost of a 3 bedroomed flat, pension, leave and medical benefits are provided.

Further particulars and application forms may be obtained from the Association of Commonwealth Universities (April), 36 Gordon Square, London, WC1H 0AJ. Applications to the Admissions Unit, Secretary's Office, University of Hong Kong, Hong Kong. The closing date for applications is 24 September 1982.

Conditions of Service will be generally those of the Local Government Service. Application forms from Establishment Officer, Scottish Examination Board, Ironmills Road, Dalkeith, Midlothian EH22 1LE (Tel 031 663 6601) to be returned by 20 August 1982.

(1037)

**FIELD SERVICE ENGINEERS**

SK + O/T + S/BY + CAR CHOICE  
Superb opportunity to join a leading Manufacturer of prestige Minis, super minis and systems. This company believes its Engineers should be software involved and offers excellent software/op. system training at its own centre.

Team working environment - possible foreign travel (voluntary) - internal promotions - a chance to get into systems.

If you have a sound technical background, seek to enhance your career into 32 bit CPU's and systems - then ring now.

If you already have a 8 or 16 bit Mini system background this could be reflected in a basic of up to £12k in a managerial or support role.

Don't delay! Ring Mike Today  
01-645 6441 or 01-394 2369 (after 7pm)

10401

AB EXECUTIVE KINGSTON

**microserve**™  
a commitment to service  
**MICROCOMPUTER SERVICE ENGINEERS**

Microserve, the nationwide field service division of the Comart Group of Companies, has established service locations in Glasgow, Manchester, Birmingham, London, Cambridge and Southampton.

We are looking for experienced service engineers to strengthen our Microserve team in the Birmingham and London areas.

If you have a minimum of 5 years' experience in the electronics industry we would like to hear from you. We would expect you to be familiar with TTL, MSI and LSI Technologies with the ability to fault find complex logic to component level. Salary will be negotiable, dependent on experience and qualifications.

Please write or telephone for an application form to: June Hamilton, Comart Limited, Little End Road, Eaton Socon, St Neots, Cambs. Telephone Huntingdon (0480) 215005.

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